

*Sub  
Sect 1  
A-19*

wherein the distal end of the pin is recessed within the plug housing, and the o-ring removal slot provides access for removal of an o-ring disposed within the o-ring groove.

Please cancel Claim 19, without prejudice.

#### REMARKS

Claims 1-35 were pending in the present application. Claims 1-38 were rejected. Applicants have amended Claims 6, 12, and 18 and have cancelled Claim 19, without prejudice. Reconsideration is respectfully requested in light of the present amendments and following remarks. The above amendments and following remarks are believed to be fully responsive to the Outstanding Office Action upon entry of these amendments and consideration of these remarks, Applicants submit that all of the pending claims will be allowable.

#### *Drawings*

The drawings were objected to under 37 CFR 1.83(a). Applicants have submitted a proposed drawing correction that shows the torch lead and a connector of a plasma arc apparatus. Support for the proposed drawing correction may be found in paragraph 23 of the specification, and therefore, Applicants submit that no new matter is entered with the proposed drawing correction. Therefore, Applicants respectfully request that the objection to the drawings be withdrawn.

***Claim Rejections - 35 USC § 102***

Claims 18-20, 23, 25, 30, and 32-35 were rejected under 35 U.S.C. § 102(b) as being anticipated by Freerks (US 5,579,718). Applicants respectfully request reconsideration of the rejections of Claims 18-20, 23, 25, 30, and 32-35 in light of the present amendments and the following remarks.

**Claims 18-20, 23, 25**

The Office Action states that Freerks discloses (Fig. 4) a sealing member (21) comprising an o-ring groove (40) disposed on a cylindrical portion of the sealing member and an o-ring removal slot (50) perpendicular to the o-ring groove.

Although Freerks discloses a sealing member 21 with a dovetail groove 40 and a small groove 50 to facilitate removal of an o-ring, the sealing member 21 does not comprise a cylindrical portion. Rather, the o-ring is disposed on a flat face 26. Claim 18 has been amended to include the cylindrical portion, and therefore cannot be anticipated by Freerks since Freerks does not disclose a cylindrical portion of a sealing member. Accordingly, Applicants respectfully request that the rejection of Claim 18 be withdrawn.

Claim 19 has been cancelled, without prejudice, and this rejection is therefore moot.

Claims 20, 23, and 25 depend from Claim 18 and distinguish over Freerks for at least the reasons stated above in connection with amended Claim 18.

Accordingly, Applicants respectfully request that the rejections of Claims 20, 23, and 25 be withdrawn.

Claims 32 and 35:

The Office Action states that the method steps are necessitated by the device structure as it is disclosed by applicant.

The device structure as disclosed by the Applicants distinguishes over Freerks as described above in connection with amended Claim 18. Accordingly, Claims 32 and 35 cannot be anticipated and Applicants respectfully request that the rejections of Claims 32 and 35 be withdrawn.

Claims 30, 33, and 34:

The Office Action states that it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations.

For the reasons stated above in connection with amended Claim 18, the prior art apparatus of Freerks does not satisfy the claimed structural limitations. Therefore, Claims 30, 33, and 34 cannot be anticipated and the Applicants respectfully request that the rejections of Claims 30, 33, and 34 be withdrawn.

***Claim Rejections - 35 USC § 103*****Claims 1, 3-5, 7-10, 12-14, 16, and 17:**

Claims 1, 3-5, 7-10, 12-14, 16, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art in view of Freerks. Applicants respectfully request reconsideration of these rejections in light of the present amendments and the following remarks.

**Claims 1, 4, 5, 9, 13, 14, and 17:**

The Office Action states that it would have been obvious to provide the admitted prior art pin with the o-ring removal slot, as taught by Freerks, to simplify removal of the o-ring from the pin.

The o-ring groove 40 as disclosed in Freerks is a dovetail groove, wherein the width, or side surfaces, slope inwardly up toward the face to form a restriction at the face. Accordingly, the restriction is narrower than the diameter of the o-ring, and once the o-ring is pressed past the restriction, it is retained between the restriction and the bottom surface of the groove. (Column 2, Lines 6-11).

Although the restriction inhibits removal of the o-ring, the o-ring is exposed and accessible along the face of the device in Freerks.

The o-ring groove according to the present invention is not a dovetail groove and therefore it would not have been obvious to provide the admitted prior art pin with the small groove 50 as taught by Freerks to simplify removal of the o-ring from the pin. Additionally, the o-ring groove of Freerks is disposed along a flat face, not around a cylindrical portion as required in the claimed

embodiment. Furthermore, the pin according to the claimed embodiment is for use in a plasma arc apparatus, whereas the device in Freerks is for use in the manufacture of semiconductor devices. Moreover, there is no teaching or suggestion to combine the teachings of Freerks with the admitted prior art pin. Therefore, it would not have been obvious to provide the admitted prior art pin with the small groove 50 as taught by Freerks and the Applicants respectfully request that the rejections of Claims 1, 4, 5, 9, 13, 14, and 17 be withdrawn.

Claims 7 and 16:

The Office Action further states that it would have been obvious to include a plurality of o-ring removal slots into a sealing member.

Claim 7 and Claim 16 distinguish over the prior art for at least the reasons stated above in connection with Claims 1, 4, 5, 9, 13, 14, and 17. Therefore, the claimed embodiments as set forth in Claims 7 and 16 are not obvious and Applicants respectfully request that the rejections of Claims 7 and 16 be withdrawn.

Claims 3, 8, and 12:

The Office Action further states that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations.

Claims 3, 8, and 12 distinguish over the prior art for at least the reasons stated above in connection with Claims 1, 4, 5, 9, 13, 14, and 17. Therefore, the claimed embodiments as set forth in Claims 3, 8, and 12 are not obvious and Applicants respectfully request that the rejections of Claims 3, 8, and 12 be withdrawn.

Claims 1, 3-5, 7-10, 12-14, 16, and 17:

Claims 1, 3-5, 7-10, 12-14, 16, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Boisvert in view of Freerks. Applicants respectfully request reconsideration of these rejections in light of the present amendments and the following remarks.

Claims 1, 3-5, 7-10, 12-14, 16, and 17 distinguish over Boisvert in view of Freerks for at least the reasons stated above in connection with the previous rejection of Claims 1, 4, 5, 9, 13, 14, and 17. Therefore, the claimed embodiments as set forth in Claims 1, 3-5, 7-10, 12-14, 16, and 17 are not obvious and Applicants respectfully request that the rejections of Claims 1, 3-5, 7-10, 12-14, 16, and 17 be withdrawn.

Claims 1, 2, 10, 11, 18, and 22:

Claims 1, 2, 10, 11, 18, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Almeras in view of Freerks. Applicants respectfully request reconsideration of these rejections in light of the present amendments and the following remarks.

Claims 1, 2, 10, 11, 18, and 22 distinguish over Almeras in view of Freerks for at least the reasons stated above in connection with the previous rejection of Claims 1, 4, 5, 9, 13, 14, and 17. Furthermore, the connector of Almeras is not for use in a plasma arc apparatus. Therefore, the claimed embodiments as set forth in Claims 1, 2, 10, 11, 18, and 22 are not obvious and Applicants respectfully request that the rejections of Claims 1, 2, 10, 11, 18, and 22 be withdrawn.

Claims 24, 27, 28, 30, and 31:

Claims 24, 27, 28, 30, and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mengle in view of Freerks. Applicants respectfully request reconsideration of these rejections in light of the present amendments and the following remarks.

Claims 24, 27, 28, 30, and 31 distinguish over Mengle in view of Freerks for at least the reasons stated above in connection with the previous rejection of Claims 1, 4, 5, 9, 13, 14, and 17. Therefore, the claimed embodiments as set forth in Claims 24, 27, 28, 30, and 31 are not obvious and Applicants respectfully request that the rejections of Claims 24, 27, 28, 30, and 31 be withdrawn.

Claim 26:

Claim 26 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Freerks. Applicants respectfully request reconsideration of these rejections in light of the present amendments and the following remarks.

Claim 26 distinguishes over Freerks for at least the reasons stated above in connection with the previous rejection of Claims 1, 4, 5, 9, 13, 14, and 17. Therefore, the claimed embodiment as set forth in Claim 26 is not obvious and Applicants respectfully request that the rejection of Claim 26 be withdrawn.

Claim 21:

Claim 21 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Freerks in view of Nejad. Applicants respectfully request reconsideration of these rejections in light of the present amendments and the following remarks.

Claim 21 distinguishes over Freerks in view of Nejad for at least the reasons stated above in connection with the previous rejection of Claims 1, 4, 5, 9, 13, 14, and 17. Additionally, the device of Nejad is not for use in a plasma arc apparatus. Therefore, the claimed embodiment as set forth in Claim 21 is not obvious and Applicants respectfully request that the rejection of Claim 21 be withdrawn.

Claims 6 and 15:

Claims 6 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art in view of Freerks, and further in view of Nejad.

Claims 6 and 15 distinguish over the admitted prior art in view of Freerks, and further in view of Nejad for at least the reasons stated above in connection with the previous rejection of Claims 1, 4, 5, 9, 13, 14, and 17, and also the

rejection of Claim 21. Therefore, the claimed embodiments as set forth in Claims 6 and 15 are not obvious and Applicants respectfully request that the rejections of Claims 6 and 15 be withdrawn.

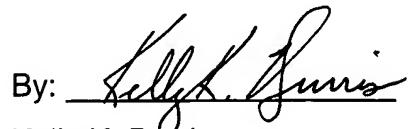
Claim 29:

Claim 29 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Mengle in view of Freerks, and further in view of Nejad.

Claim 29 distinguishes over Mengle in view of Freerks, and further in view of Nejad for at least the reasons stated above in connection with the previous rejection of Claims 1, 4, 5, 9, 13, 14, and 17, and also the rejections of Claim 21, 6, and 15. Therefore, the claimed embodiment as set forth in Claim 29 is not obvious and Applicants respectfully request that the rejection of Claim 29 be withdrawn.

For at least the reasons set forth above and in view of the amendments and remarks submitted herewith, Applicants submit that the present application is in condition for allowance. Therefore, Applicants respectfully request that the Examiner pass the case to issue at his earliest convenience. If it would advance the prosecution of this application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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Attachment for Specification Amendments

The following is a marked up version of each replacement paragraph, in which underlines indicate insertions and brackets indicate deletions.

[0015] Figure 1 is a [cutaway] perspective view of [an embodiment of an o-ring removal slot of a pin for use in a plasma arc apparatus constructed] a plasma arc cutting apparatus according to the principles of the present invention;

[0016] Figure 2 is a [top view of an embodiment of an o-ring removal slot within a pin for use in a plasma arc apparatus] cutaway perspective view of an embodiment of an o-ring removal slot of a pin for use in a plasma arc apparatus constructed according to the principles of the present invention;

[0017] Figure 3 is a [cross-sectional view, taken along plane A-A of Figure 1, of an embodiment of a method of removing an o-ring via an o-ring removal slot] top view of an embodiment of an o-ring removal slot within a pin for use in a plasma arc apparatus constructed according to the principles of the present invention; [and]

[0018] Figure 4 is a cross-sectional view [of an embodiment of an o-ring removal slot of a sealing member having an o-ring shoulder constructed], taken along plane A-A of Figure 2, of an embodiment of a method of removing an o-ring via an o-ring removal slot according to the principles of the present invention[.]; and

[0018.1] Figure 5 is a cross-sectional view of an embodiment of an o-ring removal slot of a sealing member having an o-ring shoulder constructed according to the principles of the present invention.

[0020] Referring to the drawings, a pin (not shown) according to the present invention is [illustrated and generally indicated by reference numeral 10 in Figure 1. As shown, the pin 10 comprises an o-ring groove 12 disposed around a cylindrical portion 14 of the pin 10. Further, the cylindrical portion 14 is disposed at a distal end 16 of the pin 10, which is recessed inside a connector 18 in accordance with one form of the present invention. As further shown, the pin 10 also comprises an o-ring removal slot 20 adjoining the o-ring groove 12, which provides access for removal of an o-ring 22 disposed within the o-ring groove 12, using, for example, an o-ring removal tool (not shown)] preferably employed in a plasma arc cutting apparatus 1 as shown in Figure 1, although the pin may also be used in other applications while remaining within the scope of the present invention. The plasma arc cutting apparatus 1 generally comprises a torch lead 2 that connects a torch 3 to a power supply 4, wherein both gas and electric power are conducted for operation of the plasma arc cutting apparatus 1. Additionally, a main power socket 5 is secured to the power supply 4, which is engaged by a main power plug 6 that is secured to the torch lead 2.

[0020.1] The pin according to the present invention is disposed within the main power plug 6 and is illustrated and generally indicated by reference numeral 10 in Figure 2. As shown, the pin 10 comprises an o-ring groove 12 disposed around a cylindrical portion 14 of the pin 10. Further, the cylindrical

portion 14 is disposed at a distal end 16 of the pin 10, which is recessed inside a connector 18 within the main power plug 6 in accordance with one form of the present invention. As further shown, the pin 10 also comprises an o-ring removal slot 20 adjoining the o-ring groove 12, which provides access for removal of an o-ring 22 disposed within the o-ring groove 12, using, for example, an o-ring removal tool (not shown).

[0023] [Generally] Referring to both Figures 1 and 2, the pin 10 engages [a] the main power socket [(not shown)] 5 disposed within [a] the power supply [(not shown)] 4, and the o-ring 22 provides a fluid-tight seal between the pin 10 and the main power socket 5 when the torch lead 2 is connected to [a] the power supply [(not shown)] 4 of [a] the plasma arc cutting apparatus 1. Preferably, the pin 10 is a negative lead gas carrying pin and comprises [of] a brass material. Additionally, the connector 18 is a plug housing within the main power plug 6, which is connected to the torch lead side of [a] the connection between the torch lead 2 and the power supply 4 of [a] the plasma arc cutting [torch] apparatus 1 in one form of the present invention.

[0024] Referring also to Figure [2] 3, wherein the o-ring 22 is omitted for clarity, the o-ring removal slot 20 in one form is approximately perpendicular to the o-ring groove 12 as illustrated, although other orientations such as a spiral groove that adjoins the o-ring groove 12 at an angle, may also be employed in accordance with the teachings of the present invention. Further, the o-ring removal slot 20 extends between the distal end 16 of the pin 10 and the o-ring groove 12, such that an o-ring removal tool may be inserted into the

connector 18 proximate the recessed pin 10 to engage the o-ring removal slot 20 and thus remove the o-ring 22 disposed within the o-ring groove 12.

[0026] As shown in Figure [3] 4, an o-ring removal tool 24 engages the o-ring removal slot 20 and is then advanced along the o-ring removal slot 20 to engage the o-ring 22 disposed within the o-ring groove 12. Accordingly, the o-ring removal tool 24 removes the o-ring 22 via the o-ring removal slot 20 as shown. As a result, the o-ring 22 is removed more easily since greater access thereto is gained through the o-ring removal slot 20, especially if the o-ring groove 12 is recessed within the connector 18 as previously described. As a result, the o-ring 22 may be removed relatively quickly while minimizing any damage to both the o-ring 22 as well as the pin 10 from engagement of the o-ring removal tool 24. Additionally, a plurality of o-ring removal slots 20 may be disposed within the pin 10 rather than only one o-ring removal slot 20 as described herein, such that at least one o-ring removal tool engages a plurality of o-ring removal slots to remove the o-ring 22.

[0028] Referring now to Figure [4] 5, the o-ring removal slot 20 is employed in a sealing member 26 in yet another form of the present invention, wherein the o-ring removal slot 20 adjoins a shoulder 28 rather than an o-ring groove 12 as previously described. As shown, the o-ring 22 is disposed against the shoulder 28 to seal an interface between the sealing member 26 and an adjacent sealing member (not shown). Accordingly, the o-ring removal slot 20 provides access for removal of the o-ring 22. Additionally, the o-ring removal slot 20 is approximately perpendicular to the o-ring shoulder 28, although other

orientations, such as a spiral that adjoins the shoulder 28 at an angle, may be employed in accordance with the teachings of the present invention. Furthermore, the o-ring removal slot 20 may have a constant or non-constant depth, which is sized according to the specific application so as to maintain the sealing integrity of the o-ring 22.

Attachment for Claim Amendments

The following is a marked up version of each amended claim in which underlines indicate insertions and brackets indicate deletions.

6. (Amended) The pin of Claim 1, wherein the o-ring removal slot further [comprise] comprises chamfered edges.

12. (Amended) The negative lead gas carrying pin of Claim [12] 10, wherein the housing is a plug housing connected to a torch lead of the plasma arc cutting apparatus.

18. (Amended) A sealing member comprising:  
a distal end defining a cylindrical portion;  
an o-ring groove disposed [within the sealing member] around the  
cylindrical portion; and  
an o-ring removal slot adjoining the o-ring groove,  
wherein the o-ring removal slot provides access for removal of an o-ring disposed within the o-ring groove.

19. (Cancelled) The sealing member of Claim 18 further defining a cylindrical portion disposed at a distal end of the sealing member, wherein the o-ring groove is disposed around the cylindrical portion proximate the distal end.

36. (New) A sealing member comprising:  
an o-ring groove disposed within the sealing member, the o-ring  
groove defining a substantially constant width; and  
an o-ring removal slot adjoining the o-ring groove,

wherein the o-ring removal slot provides access for removal of an o-ring disposed within the o-ring groove.

37. (New) A connector comprising:

a plug housing; and

a pin disposed within the plug housing, the pin comprising:

a distal end defining a cylindrical portion;

an o-ring groove disposed around the cylindrical portion; and

an o-ring removal slot adjoining the o-ring groove,

wherein the distal end of the pin is recessed within the plug housing, and  
the o-ring removal slot provides access for removal of an o-ring disposed within  
the o-ring groove.